Claims

What is claimed is:

[c1] An apparatus for conducting a fusion process, comprising:

a first chamber;

a second chamber maintaining an atmosphere that is substantially free of oxygen;

a closeable passage connecting the first chamber and the second chamber, the closeable passage selectively providing substantial isolation of the second chamber from the first chamber; and

a filament normally disposed in the second chamber, the filament being movable between the second chamber and the first chamber when the closeable passage is in an open position.

[c2] The apparatus of claim **1**, wherein the atmosphere in the second chamber comprises an inert gas.

[c3] The apparatus of claim **1**, wherein the first chamber maintains an atmosphere that is substantially free of oxygen at least when the filament is in the first chamber.

[c4] The apparatus of claim **3**, wherein the atmosphere in the first chamber comprises an inert gas.

[c5] The apparatus of claim **1**, wherein a pressure inside the first chamber is greater than a pressure outside the first chamber.

[c6] The apparatus of claim **1**, further comprising a pair of fiber holders coupled to the first chamber for inserting fibers into the first chamber.

[c7] The apparatus of claim **6**, further comprising means for controllably aligning the fibers within the first chamber.

[c8] The apparatus of claim **6**, wherein the first chamber comprises at least one viewing port.

[c9] The apparatus of claim **1**, further comprising means for supplying power to the filament.

[c10] The apparatus of claim **1**, wherein the filament is coupled to a support structure which is movable between the second chamber and first chamber through the closeable passage.

[c11] The apparatus of claim **10**, further including means for moving the support structure such that the filament is aligned with the fibers.

[c12] The apparatus of claim **11**, further comprising a detection means for detecting a gap between the fibers.

[c13] The apparatus of claim **1**, wherein the closable passage comprises a gate valve.

[c14] The apparatus of claim **1**, wherein the closeable passage comprises an aperture and a door member operable to selectively block off the aperture.

[c15] An apparatus for conducting a fusion process, comprising:

a first chamber;

a plurality of second chambers;

a closeable passage for connecting a selected one of the second chambers to the first chamber, the closeable passage selectively providing substantial isolation of the selected one of the second chambers from the first chamber;

a filament disposed in the selected one of the second chambers, wherein the selected one of the second chambers maintains an atmosphere that is substantially free of oxygen, the filament being movable between the selected one of the second chambers and the first chamber when the closeable passage is in an open position.

[c16] The apparatus of claim **15**, wherein the second chambers are mounted on rotatable member.

[c17] An apparatus for fabricating a microlensed fiber, comprising:

a first chamber comprising a plurality of fiber holders through which fibers are inserted into the first chamber;

a second chamber maintaining a substantially inert atmosphere;

a closable passage disposed between the first chamber and the second chamber, the closable passage selectively providing substantial isolation of the second chamber from the first chamber; and

a filament normally disposed in the second chamber, the filament being movable between the second chamber and the first chamber when the closeable passage is in an open position.

[c18] The apparatus of claim **17**, wherein the first chamber maintains an atmosphere that is substantially free of oxygen at least when the filament is in the first chamber.

[c19] A method for extending a lifetime of a filament used in a fusion process, comprising:

disposing the filament in a second chamber which maintains an atmosphere that is substantially free of oxygen;

extending the filament into a first chamber for the fusion process; and

retracting the filament back into the second chamber after the fusion process.

[c20] The method of claim **19**, wherein the first chamber maintains an atmosphere that is substantially free of oxygen at least when the filament is extended into the first chamber.

[c21] The method of claim **19**, further comprising maintaining the first chamber at a higher pressure than ambient pressure at least when the filament is extended into the first chamber.

[c22] A method for making microlensed fibers, comprising:

aligning a fiber and a rod made of lens material in a first chamber;

extending a filament from a second chamber which maintains an atmosphere that is substantially free of oxygen to the first chamber; and

fusion splicing the fiber to the rod and forming a lens from the rod using the filament.

[c23] The method of claim **22**, further comprising retracting the filament back into the second chamber after forming the lens.

[c24] The method of claim **22**, further comprising maintaining an atmosphere in the first chamber that is substantially free of oxygen at least when the filament is in extended into the first chamber.

[c25] The method of claim **22**, further comprising maintaining the first chamber at a higher pressure than ambient pressure at least when the filament is extended into the first chamber.

[c26] The method of claim **22**, wherein forming the lens from the rod comprises taper cutting the rod with the filament.

[c27] The method of claim **26**, wherein taper cutting comprises adjusting a position of the filament relative to the rod based on a thickness of a previous lens formed with the filament.

[c28] The method of claim **27**, wherein the position of the filament is adjusted such that a ratio of a thickness of the lens to a radius of curvature of the lens produced by the filament is substantially constant.